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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/534,299	05/09/2005	Michel Strobelle	271730US0PCT	9792
22850	7590	07/27/2007		
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			EXAMINER KEYS, ROSALYND ANN	
			ART UNIT 1621	PAPER NUMBER
			NOTIFICATION DATE 07/27/2007	DELIVERY MODE ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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**Office Action Summary**

Application No.

10/534,299

Applicant(s)

STREBELLE ET AL.

Examiner

Rosalynd Keys

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 24 April 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Status of Claims***

1. Claims 1-16 are pending.  
Claims 1-16 are rejected.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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Takehisa (JP 04327582) teaches preparation of epichlorohydrin comprising purification of allyl chloride to lower the 1,5-hexadiene content and reacting with alkyl hydroperoxide in the presence of a catalyst (see attached Patent Abstract of Japan as well as the CAPLUS, JAPIO and WPIDS abstracts). It is desirable to produce an epichlorohydrin from an allyl chloride having a 1,5-hexadiene content of  $\leq$  0.1wt% (see attached abstracts). Takehisa teaches that usually allyl chloride contains 0.3-0.5 weight% of 1,5-hexadiene, which is converted to 1,2-epoxy-5-hexene in oxidation (see attached WPIDS abstract). In the WPIDS abstract it is taught that this by-product 1,2-epoxy-5-hexene cannot be separated from epichlorohydrin by distillation. Thus, the process of Takehisa allows one to more economically prepare high purity epichlorohydrin.

Takehisa differs from the instant claims in that the epoxidation is carried out using an alkyl peroxide rather than a hydrogen peroxide.

Strebelle et al. (US 6,288,248 B1) teach a process for the manufacture of epichlorohydrin by reaction of allyl chloride with a peroxide compound in the presence of a TS-1 catalyst and a solvent such as methanol (see entire disclosure, in particular column 1, line 5 to column 3, line 33). Strebelle et al. teach that the peroxide compound which can be used in their invention can be chosen from hydrogen peroxide and any peroxide compound containing an active oxygen and capable of carrying out an epoxidation (see column 2, lines 29-36).

One having ordinary skill in the art at the time the invention was made would have found it obvious to substitute hydrogen peroxide, as taught by Strebelle et al. for the alkyl peroxides of Takehisa, since Strebelle et al. teach that in the preparation of epichlorohydrin alkyl peroxides are interchangeable with hydrogen peroxide.

5. Claims 1-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Strebelle et al. (US 6,288,248 B1) in view of Takehisa (JP 04327582).

Strebelle et al. teach the invention as described above. A loop reactor is disclosed in

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example 1. Strebelle et al. disclose all of the claimed limitations except the use of an allyl chloride comprising less than 2000 ppm by weight of 1,5-hexadiene.

Takehisa teaches a process for preparing an epichlorohydrin, which is analogous to the claimed process. Takehisa teaches that in said process it is desirable to utilize an allyl chloride comprising a 1,5-hexadiene content below 0.1 weight % (1000 ppm). The 1,5-hexadiene is taught to be converted to 1,2-epoxy-5-hexene by oxidation (see attached WPIDS abstract). In the WPIDS abstract it is taught that this by-product 1,2-epoxy-5-hexene cannot be separated from epichlorohydrin by distillation. Thus, the process of Takehisa allows one to more economically prepare high purity epichlorohydrin.

One having ordinary skill in the art at the time the invention was made would be motivated to utilize an allyl chloride having a 1,5-hexadiene content below 0.1 weight % (1000 ppm), as taught by Takehisa, in the process of Strebelle et al. because it would allow the artisan to prepare the epichlorohydrin of Strebelle et al. without formation of the unwanted by-product, 1,2-epoxy-5-hexene, which would form as a result of the oxidation of the 1,5-hexadiene by the peroxide used in the epoxidation of allyl chloride.

The Examiner believes that the teaching of Takehisa is properly combinable with the teaching of Strebelle et al. because they are directed to analogous subject matter, i.e. epoxidation of an allyl chloride with a peroxide and both seek to solve a similar problem in the art, i.e. generation of unwanted by-products which are difficult to remove from epichlorohydrin.

Although Strebelle et al. teach the use of solvent the skilled artisan would find it obvious to also conduct the reaction in the absence of a solvent, since Takehisa teaches that the use of a solvent is optional (see paragraph 0010).

Although Strebelle et al. do not specifically teach the use of the zeolites MCM-41, the skilled artisan would have found it obvious to utilize any zeolite which is similar in structure to either TS-1, ZSM-5 or ZSM-11 (see column 2, lines 14-23).

***Response to Amendment***

6. The rejection of claims 1-6, 8, and 11 under 35 U.S.C. 103(a) as being unpatentable over Takehisa (JP 04327582) in view of Strebelle et al. (US 6,288,248 B1) is withdrawn, since the claims have been limited to zeolite catalyst.

7.

***Response to Arguments***

8. Applicant's arguments filed April 24, 2007 have been fully considered but they are not persuasive.

The Applicants argue that Strebelle et al. and Takehisa are not combinable. The Examiner disagrees. Strebelle et al. and Takehisa teach the importance of obtaining a epichlorohydrin with reduced impurities content (see column 1 of Strebelle et al. and paragraph 0004 of Takehisa). Although Strebelle et al. focus more on removing chloro impurities, the object of Strebelle et al. is to obtain a purer epichlorohydrin product (see paragraph 4). The skilled artisan would have been motivated to utilize any means by which to do so, including the use of a allyl chloride starting material which contains less than or equal to 0.1wt% of 1,5-hexadiene, as taught by Takehisa. The use of a combination of the teaching of Strebelle et al. with that of Takehisa would allow the skilled artisan to obtain an even purer epichlorohydrin product.

The Applicants argue that the underlying reactions of Strebelle et al. and Takehisa are quite different from one another. The Examiner disagrees. Although the references do not use the same catalyst they are making the same product by reacting allyl chloride with a using similar peroxide reactant (see column 2, lines 29-36 of Strebelle et al., which show that alkyl peroxides and hydrogen peroxide are interchangeable as the peroxide reactant). Further, it is well known that different catalysts are capable of catalyzing the same reaction.

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The Applicants arguments with respect to unexpected results have been considered but the examiner believes that the prior art references when combined would give one an easy method for obtaining high purity epichlorohydrin product that would inherently overcome the reduced catalyst life problem relied upon by Applicants for patentability. Granting a patent on the discovery of an unknown but inherent function would re-move from the public that which is in the public domain by virtue of its inclusion in, or obviousness from, the prior art.

For the above reasons the rejection of 1-10, 12 and 13 is maintained.

### **Conclusion**

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rosalyn Keys whose telephone number is 571-272-0639. The examiner can normally be reached on M, W & F 5:30-7:30 am & 1-5 pm; T & Th 5:30 am-4 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eyle Yvonne can be reached on 571-272-0871. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
Rosalynd Keys  
Primary Examiner  
Art Unit 1621

July 23, 2007